# United States Patent [19]

**Sonnabend**

[11] **4,384,096**

[45] **May 17, 1983**


[54] **LIQUID EMULSION POLYMERS USEFUL AS PH RESPONSIVE THICKENERS FOR AQUEOUS SYSTEMS**


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[21] Appl. No.: **219,480**

[22] Filed: **Dec. 23, 1980**

**Related U.S. Application Data**

[63] Continuation of Ser. No. 70,061, Aug. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 964,113, Nov. 27, 1978, abandoned.

[51] **Int. Cl.**[3] ..... **C08F 20/30;** C08F 20/28; C08F 20/06

[52] **U.S. Cl.** ..... **526/313;** 524/522; 524/558; 526/317; 526/318

[58] **Field of Search** ..... 260/29.6 H, 29.6 TA, 260/29.6 RW; 526/313, 317, 318, 320



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[57] **ABSTRACT**

Novel aqueous liquid emulsion polymers are prepared by the copolymerization of (A) about 15–60 weight percent of a $C_3$–$C_8$ $\alpha,\beta$-ethylenically unsaturated carboxylic acid monomer, preferably acrylic or methacrylic acid or a mixture thereof with itaconic or fumaric acid, (B) about 15–80 weight percent of a nonionic copolymerizable $C_2$–$C_{12}$ $\alpha,\beta$-ethylenically unsaturated monomer, preferably a monovinyl ester such as ethyl acrylate or a mixture thereof with styrene, acrylonitrile, vinyl chloride or vinyl acetate, and (C) about 1–30 weight percent of certain nonionic vinyl surfactant esters, such as nonylphenoxypoly(ethyleneoxy)$_9$ ethyl acrylate, to give an emulsion copolymer stable as an aqueous colloidal dispersion at an acid pH lower than about 5.0 but responsive to pH adjustment with base. These emulsion polymers adjusted to a pH of about 5.5 or higher are effective thickeners for a wide variety of aqueous systems including cosmetic products, drilling muds, and particularly aqueous coating compositions such as latex paint.


**30 Claims, 1 Drawing Figure**